

Appln. No. 10/502,109

Attorney Docket No. 10555-46

II. Remarks

Claims 1-19 stand rejected. Claims 1, 8-10 and 16 are being amended. Accordingly, after entering this amendment, claims 1-19 remain pending.

Reconsideration and re-examination of this application in view of the above amendments and the following remarks is herein respectfully requested.

Allowable Subject Matter

The undersigned acknowledges the Examiner's indication of the allowability of claims 8, 9, and 16 if rewritten in independent form including all the limitations of the base claim and any intervening claims. Accordingly, claims 8 and 16 have been rewritten in independent form including all the limitations of the base claims (claim 1 and claim 10, respectively) and any intervening claim, and claim 9 has been amended for clarity. In view of these amendments, it is submitted that claims 8, 9, and 16 are allowable. Further, the undersigned acknowledges the Examiner's indication that claims 17-19 are allowed.

Claim Rejections - 35 U.S.C. §102(b)

Claims 1-3, 7 and 10-12 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,887,134 to Saito, et al. (Saito). Saito, however, does not teach each and every element of amended claims 1 and 10.

For example, Saito's invention relates to a "non-single-crystal" "graded band gap transistor" and "graded band gap diode" (emphasis added; col. 1, lines 19-20); contrarily, the present invention relates to a photodetector with "an

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enhanced layer having a graded **doping concentration**" (emphasis added; paragraph [0011], line 4 of the present application). Further, the Examiner has mistakenly confused Saito's "Fig. 5a showing region 505", which displays a **band gap grading** of the conduction band (502(a)), with the **graded doping concentration** disclosed in the present application. Specifically, Saito teaches that "it is desired for the **band gap** to be such that is continuously graded in at least one of the first and second non-single-crystal layer regions, that only one of the **valence band** and the **conduction band** is continuously **graded...**" (emphasis added; col. 7, lines 7-11). Additionally, Saito teaches that doping is a side issue of no importance in the non-single-crystal structure, which is demonstrated in Saito's disclosure that "the dopant can be evenly or unevenly distributed" (col. 8; lines 16-17).

As a result, Saito fails to teach a photodetector with a "second p-type semiconductor layer having a **graded doping concentration**" as in amended claim 1 or the "**grading of the p-type dopant** of the second p-type semiconductor layer from a first concentration to a second concentration" as in amended claim 10. Thus, Saito's "graded band gap diode" is distinctly different from the "graded doping" photodiode as recited in amended claims 1 and 10.

Thus, the rejection under 35 U.S.C. §102(b) should be withdrawn. Further, since claims 2-3, 7, and 11-12 depend directly or indirectly from claims 1 or 10, the reasons for allowance of claims 1 and 10 apply as well to the dependent claims.



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Claim Rejections - 35 U.S.C. §103(a)

Claims 4-6 and 13-15 were rejected under 35 U.S.C. §103(a) as being unpatentable over Saito. As stated above, Saito does not teach or suggest all the elements of claim 1 and amended claim 10. There is no suggestion or motivation in Saito that would lead to the elements recited in amended claims 1 and 10. Saito's teaching of using non-single-crystal material to achieve "graded band gap diode" would be inoperative if the single-crystal semiconductor layers of InAlAs and InGaAs were used to substitute the SiGe non-single-crystal layers. Furthermore, Saito states that "it is commonly recognized that it is difficult to make a **single crystal film** ... since the grading constants of Si and Ge are different from each other" (emphasis added; col. 1; lines 46-50).

Accordingly, Saito cannot render claims 4-6 and 13-15 as obvious. The rejection under U.S.C. §103(a) is therefore improper and should be withdrawn.



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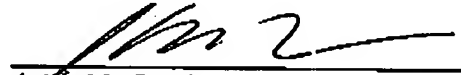
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Conclusion

In view of the above amendments and remarks, it is respectfully submitted that the present form of the claims (claims 1-19) are patentably distinguishable over the art of record and that this application is now in condition for allowance. Such action is respectfully requested.

Respectfully submitted by,

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